CALCULATIONS

AND

TABLES

Relating to the

ATTRACTIVE VIRTUE

OF

LOADSTONES.

SERVING

To the Finding Out the Comparative
Degrees of Goodneſs between
ſeveral of Them.

Alſo to know how much any LOADSTONE,
being of any propoſed Weight,
would ſuſtain.

And alſo for to Know the Value in Money of any

LOADSTONE.

By James Lord Paisley now Earl of Abercorne

Hamilton

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THE Principle upon which theſe Tables are formed, is this:

That if Two *Loadſtones* are perfectly Homogeneous, that is, if their Matter be of the ſame Specifick Gravity, and of the ſame Virtue in all Parts of one Stone, as in the other; and that Like Parts of their Surfaces are Cap'd or Arm'd with Iron; then the Weights they ſuſtain will be as the Squares of the Cube Roots of the Weights of the *Loadſtones*; that is, as their Surfaces.

This Principle I have found to hold good, by ſeveral Experiments very carefully made, particularly the following:

I have Two very good ſmall *Loadſtones*, cut out of the ſame Stone, and conſequently as Homogeneous as can be got, the one is a Cube, and the other a Terella, both exactly of the ſame Weight, *viz.* 2 Pennywt. 10 Gr.

Becauſe I would have their Armings alſo as Homogeneous as poſſible, I got ſome of the fineſt *Venice* Steel I could procure. The Caps of the two *Loadſtones* were made out of it, exactly of the ſame Weight, and covered Like Parts of their Surfaces, that is to ſay, one ſixth Part at each Pole.

Being thus arm'd, I found the Cube to ſuſtain ſomewhat more than the Terella, nearly in Proportion to the difference of their Surfaces.

Afterwards I got other Caps made for the Terella, of the ſame Steel, and of the ſame Weight; but which covered a greater Part of its Surface at each Pole, by which means the Terella ſuſtain'd more than the Cube.

	℔	Oz.	Dwt.
The Terella ſuſtains ——	1	1	7
And the Cube —— ——	1	0	2

This laſt Experiment proves the Spherical to be the moſt advantageous Shape of the two.

I Arm'd theſe *Loadſtones* with the fineſt of Steel, for the ſake of the greater Certainty of having all the Caps as Homogeneous as could be; otherwiſe the ſofteſt of Iron is much the beſt for Arming *Loadſtones*, by nearly one Fifth of the Weight ſuſtain'd.

So that if theſe *Loadſtones* had been arm'd with ſoft Iron, the Terella would ſuſtain about 1 ℔ 4 Oz. 0 Pennywt. and the Cube about 1 ℔ 2 Oz. 10 Pennywt. Nearly this difference between Steel and Iron I have found by ſeveral Experiments.

The Firſt Column in theſe Tables is in common to the Four following, and helps to ſhow how many Times its Weight any *Loadſtone* ſuſtains.

In the 2d, 3d, 4th and 5th Columns, are the Weights of *Loadſtones*, in different Denominations.

The Second, intituled *Grains*, reaches, Grain by Grain, no farther than to one Ounce, that is to ſay, from 1 to 480 Grains; and will ſerve for any *Loadſtone* whoſe Weight does not exceed 1 Ounce.

The Third, intituled *Pennywts.* reaches (by Pennywts.) up to two Pounds, *viz.* from 1 to 480 Pennywts. ſo that it ſerves for any Stone that weighs not leſs than 1 Pennywt. nor more than 2 ℔.

The Fourth Column, intituled *Ounces*, reaches (by Ounces) up to 40 Pounds, and will therefore ſerve for a *Loadſtone* that does not exceed that Weight.

The Fifth, intituled *Pounds*, ſerves from 1 to 480 Pounds.

The Sixth Column, intituled, *Weight ſuſtain'd*, is in common to the Four preceding. The Numbers in this Table if they were divided by 10, would be the Squares of the Cube Roots of the Numbers in natural Order from 1 to 480, as they are found in the Column of *Pounds*.

Theſe Squares of the Cube Roots are here multiplyed by 10, becauſe a *Loadſtone* of the very worſt ſort, if it weigh but one Grain will ſuſtain ten Grains; and ſo theſe Tables, by ſimple Inſpection, ſhow what Number of Grains any *Loadſtone* of that worſt Character would ſuſtain, if the Stone weigh not more than 480 Grains or 1 Ounce.

The Numbers in the Firſt Column, intituled *How often its Weight*, are proportional to the Reciprocals of the Cube Roots of the Natural Numbers, and are form'd by dividing the Numbers in the Sixth Column, by the correſponding Natural Numbers, as they are found in the Column of *Pounds*.

For the greater Convenience of Calculation, there are added Tables.

Firſt of Decimal Parts, *for Pennywts*, *for Ounces*, and *for Pounds:* The Uſe whereof is to loſe as little as poſſible of the Fractions in the ſeveral Calculations.

The next are *Tables of Grains*, *Pennywts*, *Ounces*, and *Pounds*, which ſave Trouble by readily ſhewing how many of each Denomination are contain'd in the others.

The Tables, intituled *from Grains to Pennywts*, &c. and the Others from the ſeveral Denominations to Others, are of Uſe for carrying the Computation readily from any one Denomination to another.

And the Tables at the bottom of theſe laſt mention'd are of like Uſe for the ready finding the Value in Money of any *Loadſtone*, from the *Numbers* proper to *Grains*, to *Pennywts*, to *Ounces*, and to *Pounds*.

To explain the Uſes of theſe Tables; for the firſt Example, I will propoſe my little (but beſt) Terella, which weighs 5 Pennywt. 19 Gr. and ſuſtains 4 ℔ 1 Oz. 10 Pennywt. As the Weight of this *Loadſtone* does not exceed 480 Grains, I make uſe of the Tables as for *Grains*. Therefore I reduce the Weight ſuſtain'd to Grains by the help of the *Tables of Grains*, *&c.*

For oppoſite to 4 ℔ I find ——— 23040
And oppoſite to 1 Oz. ——— 480
And oppoſite to 10 Pennywt. ——— 240

Which added together make ——— 23760

the Number of Grains in 4 ℔ 1 Oz. 10 Pennywt.

Then looking in the Column of *Grains* for 5 Pennywt. 19 Gr. (the Weight of the Stone) againſt it in the Column of *Weight ſuſtain'd*, I find 268. 33 This is the Number of Grains a very bad Stone of that Weight would ſuſtain, as has been ſaid in the Deſcription of the Column of *Weight ſuſtain'd.* But the Stone propoſed ſuſtains 23760 Grains; therefore dividing 23760 by 268. 33 the Quotient

tient 88. 548 ſhows the Character of Goodneſs in the Stone propoſed: And by the help of this *Number* I can readily know, what Weight any other Stone of equal Goodneſs with this would ſuſtain.

Suppoſe that other Stone to weigh but 15 Grains, then in the Column for *Grains* looking for 15 Gr. againſt it in the Column of *Weight ſuſtain'd*, I find 60. 82 therefore multiplying the Quotient (above found) 88.548 by 60. 82 the Product 5385 is the Number of Grains this other Stone of 15 Gr. will ſuſtain, that is, 11 Oz. 4 Pennywt. 9 Gr.

Suppoſe another *Loadſtone* of the ſame Character to weigh one Ounce or 480 Grains, as this is ſtill in the Compaſs of the Column for *Grains*, I look in that Column for one Ounce, and againſt it, in the Column of *Weight ſuſtain'd*, I find 613. 05 which multiplying by 88. 548 (the Quotient above found) the Product 54284 is the Number of Grains this Stone of 1 Ounce Weight would ſuſtain, that is 9 ℔ 5 Oz. 1 Pennywt. 20 Gr.

Suppoſe another *Loadſtone* of the ſame Character to weigh 1 ℔ 9 Oz. 13 Pennywt. to know what Weight this will ſuſtain, I can no longer uſe the Column of *Grains*, becauſe this is much more than 480 Grains; but as it is leſs than 2 ℔ or 480 Pennywts, therefore I transfer the Computation from *Grains* to *Pennywts.* by the help of the Table under that Title.

But

But before I do this, it is proper to ſhew how theſe Numbers *from Grains to Pennywts, &c.* are form'd.

It muſt be obſerved, that the Numbers in the Column of *Weight ſuſtain'd*, ſtand ſucceſſively to ſignify *Grains*, *Pennywts*, *Ounces* and *Pounds*, as this Column is ſucceſſively join'd to the Columns of thoſe Denominations.

Therefore when the Denominations are alter'd from one to another, to make this Table fit a Stone of the ſame Character of Goodneſs in both Denominations; the Numbers in it muſt be alter'd according to the Occaſion.

Thus ſince one Pennywt. is equal to 24 Grains, what a Stone of any Number of Pennywts. ſuſtains, muſt be to what a Stone of the ſame Number of Grains ſuſtains, as the Square of the Cube Root of 24 is to 1: Multiplying therefore the Number in the Column of *Weight ſuſtain'd* which ſtands againſt the Number of Grains that any *Loadſtone* weighs, by the Square of the Cube Root of 24, that will give the Number of Grains which a Stone weighing the ſame Number of Pennywts. will ſuſtain.

But I would have this laſt Weight ſuſtain'd to be expreſs'd, not in *Grains*, but in *Pennywts*, therefore I muſt divide it by 24; but firſt multiplying by the Square of the Cube Root of 24, and then dividing by 24, is the ſame as if at once I had divided by the Cube Root of 24, or multiplyed by the Reciprocal of it. Accordingly the Number againſt Unit in the Table intituled, *from Grains to Pennywts,* is the Reciprocal of the Cube Root of 24; and in like manner, ſince there are 480 Grains in an Ounce, the Number *from Grains to Ounces* is the Reciprocal of the Cube Root of 480. And all the other Numbers of this kind are form'd in the ſame manner.

Now to proceed in our Example; ſince I muſt go from the Denomination of *Grains*, to that of *Pennywts.* the Number 88.548 which expreſſes the Character of Goodneſs of the Stone for *Grains*, muſt be alter'd to make it do the ſame thing for *Pennywts.* I therefore multiply this Number 88.548 by 0.3466807 (which is the Reciprocal of the Cube Root of 24.) This is readily done by the Table, as follows:

8 - - - - - - - 27.734456

8. - - - - - - - 2.773445

5 - - - - - - - - 173340

4 - - - - - - - 13867

8 - - - - - - - 2773

88.548 equal to 30.697|881

Retaining only the five firſt Figures (as being ſufficient) I have got 30.698 the Number for *Pennywts.*

After-

Afterwards I look in the Column of *Pennywts.* for 1 ℔ 9 Oz. 13 Pennywts. (the Weight of the Stone propoſed) and againſt it in the Column of *Weight ſuſtain'd*, I find 572. 35 which being multiplyed by 30.698 gives 17570 Pennywts. that is, 73 ℔ 2 Oz. 10 Pennywts. for the Weight this Stone weighing 1 ℔ 9 Oz. 13 Pennywts. would ſuſtain.

If I would farther know what a Stone of the ſame Quality of Goodneſs, and weighing 2 ℔ 6 Oz. would ſuſtain.

Since this Weight 2 ℔ 6 Oz. exceeds 480 Pennywts, I muſt uſe the Denomination of *Ounces*, and therefore muſt find the *Number* of the Stone for *Ounces*. Which I may do either by the *Number for Grains* 88.548 multiplying it by the Number againſt Unit in the Table *from Grains to Ounces*, or by the *Number for Pennywts.* 30.698 multiplying it by the Number againſt Unit in the Table *from Pennywts to Ounces*. Either Way it gives 11. 309 for the *Number for Ounces*. Then looking in the Column of *Ounces* for 2 ℔ 6 Oz. (which is the Weight of the Stone) againſt it I find 96. 55 which being multiplyed by the *Number* 11. 309 (juſt now found) gives the Number of Ounces the Stone will ſuſtain, *viz.* 1091.883 that is 90 ℔ 11 Oz. 17 Pennywt. 15 Gr.

The Column of *Pounds* is only uſeful where a *Loadſtone*'s Weight exceeds 40 ℔ or

480 Ounces, in which caſe the ſame Method muſt be uſed as with the others.

So that ſuppoſing a Stone of the ſame Character with the beforementioned, weigh'd 64 ℔; if I us'd (indifferently) any of the *Numbers* already found, proper to the Columns of the ſeveral Denominations, I ſhould find 4.9397 for the *Number* for the Column of *Pounds*; and looking in it for 64 Pounds (the Weight of the Stone) againſt it I find 160.00 which multiply'd by 4.9397 gives 790.3520 that is 790 ℔ 4 Oz. 4 Pennywt. 11 Gr. for the Weight it would ſuſtain.

To know how many Times a *Loadſtone* takes up its own Weight; multiply the *Number* proper to the Denomination in Uſe, by the Number in the firſt Column, (intituled *how often its Weight)* that is againſt the Weight of the Stone in the Column of that Denomination.

The Stone in the firſt Example which weigh'd 5 Pennywt. 19 Gr. its *Number* 88.548 being multiply'd by 1.930 which is oppoſite to its Weight in the Column of *Grains*, gives 170.89 Times its Weight it ſuſtains.

And the Stone in the laſt Example which weigh'd 64 ℔ its *Number* 4.9397 multiply'd by 2.500 which is againſt its Weight in the Column of *Pounds*, gives 12.349 Times it ſuſtains its own Weight.

There remains only to explain the Uſe of the Tables relating to the *Value of Loadſtones in Money*.

Before I do this, it is neceſſary to obſerve that I ſuppoſe the Value of *Loadſtones* to be in the Compound Proportion of the Goodneſs of the Stone, and of the Weight it ſuſtains.

This is agreeable to Reaſon, becauſe that if two *Loadſtones* of different Bigneſs and Weight, take up the ſame Weight; the Leſſer ought to be, and is eſteemed more valuable, as it does more in Proportion to its Bulk, than the Larger; and what better Rule to eſtimate the Value by, than the Goodneſs of the Stone? On the other hand, if the Stones are in Nature equally good, but ſuſtain different Weights, it is reaſonable that their Value ſhould be according to the Weights they ſuſtain. And both theſe Circumſtances conſidered together, make the Value to be in the Compound Froportion of the Goodneſs of the Stone, and the Weight it ſuſtains.

Therefore in order to find the Value of any *Loadſtone*; I firſt multiply the *Number* for the Stone (which I have already ſhewn how to find) by the Number intituled, *Value in Money*, taking this Value in Money from *Grains*, if the *Number* of the Stone be from *Grains:* From *Pennywts.* if the *Number* of the Stone be from *Pennywts.* and ſo of the Other Denominations.

This Product of the Value in Money by the *Number* of the *Loadſtone*, I call the Value *per* Ounce of what the Stone ſuſtains. Then multiplying this Value *per* Oz. by the Number of Ounces the Stone ſuſtains, will give the Value in Money of the *Loadſtone* propoſed.

Thus in the firſt Example, the *Number* of the Stone by *Grains* was found to be 88.548 multiplying this by the Value in Money from *Grains*,

8 - - - - - - - - 0.4000000
8. - - - - - - - 0400000
5 - - - - - - - - 025000
4 - - - - - - - - 02000
8 - - - - - - - 0400

88.548 .44274|00

gives .44274 Decimal Parts of a Pound Sterling for the Value *per* Ounce. As that *Loadſtone* ſuſtains 4 ℔ 1 Oz. 10 Pennywt. that is 49 Ounces; ſo multiplying the Value *per* Oz. by 49 gives the Value of the Stone 21 ℔. 694, that is 21 *l.* 13 *s.* 10 *d.* ¾.

The Value of the Pennywts. a Stone ſuſtains, is readily known alſo, from the Value *per* Oz. found; for as 20 Pennywts. make 1 Oz, 'tis but prefixing a Cypher (after the Point) to the Value found *per* Oz. and dividing that afterwards by 2. as in this Caſe .44274 is the Value *per* Oz. prefixing a Cypher to it .044274 divided by 2. gives - - - - - .022137 for

for the Value *per* Pennywt. which multiplyed by the odd Pennywts. which here are 10, gives .22137 for thoſe ten Pennywts, that is, 0 *l.* 4 *s.* 5 *d* ¼. So that in ſtrictneſs that *Loadſtone* is worth 21 *l.* 18 *s.* 4 *d.*

Another *Loadſtone* was propoſed of the ſame Character whoſe Weight was 1 ℔ 9 Oz. 13 Pennywt. and it was found to ſuſtain 17570 Pennywts. The *Number* of this Stone by *Pennywts.* was found to be 30. 698 therefore multiplying this *Number* by the *Value in Money from Pennywts.*

3 - - - - - - - - 0.4326750
0. - - - - - - - 0000000
6 - - - - - - - - - 086535
9 - - - - - - - - 12980
8 - - - - - - - - 1153

30.698 gives .44274|18

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for the Value *per* Oz. *viz.* the ſame as before when we proceeded by *Grains*, the *Loadſtones* being of the ſame Quality. But this Stone ſuſtains 17570 Pennywts. which make 878.50 Ounces, multiplying therefore the Value *per* Oz. .44274 by the Number of Ounces ſuſtain'd, gives 388.947 for the Value of the Stone, that is 388 *l.* 18 *s.* 11 *d.* ½.

In the Inſtances already given, the Prices come out proportionable to the Weights ſuſtain'd by the *Loadſtones*, becauſe they being of the ſame Quality of Goodneſs, the Values *per* Oz. are the ſame in them all. But

But let us ſuppoſe another *Loadſtone* of a different Character, which weighing 3 Pounds ſuſtains 32 Pounds. Looking for 3 ℔ in the Column of *Pounds*, againſt it in the Column of *Weight ſuſtain'd*, I find 20.80 dividing then the true Weight ſuſtain'd 32 ℔ by this Number, I ſhall have 1.5384 for the *Number* of this Stone (*by Pounds*); now comparing the Degree of Goodneſs of this Stone with that of the Others already treated of, it is evident the preſent Stone is worſe than the others, in the Proportion of 1.5384 to 4.9397 which is the *Number* that was found for the Character of their Goodneſs (by *Pounds*.)

And as the Value *per* Oz. is produced by multiplying a conſtant given Number by the *Number* of every particular *Loadſtone* ; it is plain that the Value *per* Ounce of theſe two *Loadſtones* will be in the Proportion of the *Numbers* expreſſing the Characters of the Stones.

Then the compleat Value of the *Loadſtone* being found by multiplying the Value *per* Oz. into the Number of Ounces the Stone ſuſtains; it is evident that the Values of *Loadſtones*, by this Method of Computation, are in the Compound Proportion of the Degrees of Goodneſs of the *Loadſtones*, and of the Weights they ſuſtain.

FINIS.

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Pennywts.	Ounces	Pounds	
10.000	1	0:0:1	0:1	1	10.00
7.937	2	2	2	2	15.87
6.934	3	3	3	3	20.80
6.300	4	4	4	4	25.20
5.848	5	5	5	5	29.24
5.503	6	6	6	6	33.02
5.228	7	7	7	7	36.59
5.000	8	8	8	8	40.00
4.808	9	9	9	9	43.27
4.642	10	10	10	10	46.42
4.496	11	11	11	1	49.46
4.368	12	12	1:0	2	52.42
4.253	13	13	1	3	55.29
4.149	14	14	2	4	58.09
4.055	15	15	3	5	60.82
3.968	16	16	4	6	63.50
3.889	17	17	5	7	66.12
3.816	18	18	6	8	68.68
3.748	19	19	7	9	71.20
3.684	20	0:1:0	8	20	73.68
3.624	21	1	9	1	76.12
3.569	22	2	10	2	78.52
3.516	23	3	11	3	80.88
3.467	1:0	4	2:0	4	83.20

How often its Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Penny w^ts.	Ounces	Pounds	
3.420	1 1	0:1:5	2:1	25	85.50
3.375	2	6	2	6	87.76
3.333	3	7	3	7	90.00
3.293	4	8	4	8	92.21
3.255	5	9	5	9	94.39
3.218	6	10	6	30	96.55
3.183	7	11	7	1	98.68
3.150	8	12	8	2	100.79
3.118	9	13	9	3	102.88
3.087	10	14	10	4	104.95
3.057	11	15	11	5	107:00
3.029	12	16	3:0	6	109.03
3.001	13	17	1	7	111.03
2.974	14	18	2	8	113.03
2.949	15	19	3	9	115.00
2.924	16	0:2:0	4	40	116.96
2.900	17	1	5	1	118.90
2.877	18	2	6	2	120.83
2.854	19	3	7	3	122.74
2.832	20	4	8	4	124.63
2.811	21	5	9	5	126.51
2.791	22	6	10	6	128.38
2.771	23	7	11	7	130.24
2.751	2:0	8	4:0	8	132.08

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny wt.	Ounces.	Pounds.	
2.733	2 : 1	0 : 2 : 9	4 : 1	49	133.90
2.714	2	10	2	50	135.72
2.696	3	11	3	1	137.52
2.679	4	12	4	2	139.32
2.662	5	13	5	3	141.10
2.646	6	14	6	4	142.87
2.630	7	15	7	5	144.62
2.614	8	16	8	6	146.37
2.598	9	17	9	7	148.11
2.583	10	18	10	8	149.84
2.569	11	19	11	9	151.55
2.554	12	0 : 3 : 0	5 : 0	60	153.26
2.540	13	1	1	1	154.96
2.527	14	2	2	2	156.65
2.513	15	3	3	3	158.33
2.500	16	4	4	4	160.00
2.487	17	5	5	5	161.66
2.474	18	6	6	6	163.32
2.462	19	7	7	7	164.96
2.450	20	8	8	8	166.60
2.438	21	9	9	9	168.23
2.426	22	10	10	70	169.85
2.415	23	11	11	1	171.46
2.404	3 : 0	12	6 : 0	2	173.07

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Penny w^{ts}.	Ounces	Pounds	
2.393	3:1	0:3:13	6:1	73	174.67
2.382	2	14	2	4	176.26
2.371	3	15	3	5	177.84
2.361	4	16	4	6	179.42
2.350	5	17	5	7	180.99
2.340	6	18	6	8	182.56
2.330	7	19	7	9	184.11
2.321	8	0:4:0	8	80	185.66
2.311	9	1	9	1	187.21
2.302	10	2	10	2	188.74
2.292	11	3	11	3	190.28
2.283	12	4	7:0	4	191.80
2.274	13	5	1	5	193.32
2.265	14	6	2	6	194.83
2.257	15	7	3	7	196.34
2.248	16	8	4	8	197.84
2.240	17	9	5	9	199.34
2.231	18	10	6	90	200.83
2.223	19	11	7	1	202.31
2.215	20	12	8	2	203.79
2.207	21	13	9	3	205.27
2.199	22	14	10	4	206.74
2.191	23	15	11	5	208.20
2.184	4:0	16	8:0	6	209.66

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny wt.	Ounces.	Pounds.	
2.176	4:1	0:4:17	8:1	97	211.11
2.169	2	18	2	8	212.56
2.162	3	19	3	9	214.00
2.154	4	0:5:0	4	100	215.45
2.147	5	1	5	1	216.88
2.140	6	2	6	2	218.31
2.133	7	3	7	3	219.73
2.126	8	4	8	4	221.15
2.120	9	5	9	5	222.57
2.113	10	6	10	6	223.98
2.106	11	7	11	7	225:38
2.100	12	8	9:0	8	226.79
2.093	13	9	1	9	228.18
2.087	14	10	2	110	229.58
2.081	15	11	3	1	230.97
2.074	16	12	4	2	232.35
2.068	17	13	5	3	233.73
2.062	18	14	6	4	235.11
2.056	19	15	7	5	236.48
2.050	20	16	8	6	237.85
2.045	21	17	9	7	239.22
2.039	22	18	10	8	240.58
2.033	23	19	11	9	241.93
2.027	5:0	0:6:0	10:0	120	243.29

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny wts.	Ounces.	Pounds.	
2.022	5 : 1	0 : 6 : 1	10 : 1	121	244.64
2.016	2	2	2	2	245.98
2.011	3	3	3	3	247.33
2.005	4	4	4	4	248.66
2.000	5	5	5	5	250.00
1.995	6	6	6	6	251.33
1.989	7	7	7	7	252.66
1.984	8	8	8	8	253.98
1.979	9	9	9	9	255.30
1.974	10	10	10	130	256.62
1.969	11	11	11	1	257.94
1.964	12	12	11 : 0	2	259.25
1.959	13	13	1	3	260.56
1.954	14	14	2	4	261.86
1.949	15	15	3	5	263.16
1.944	16	16	4	6	264.46
1.940	17	17	5	7	265.75
1.935	18	18	6	8	267.05
1.930	19	19	7	9	268.33
1.926	20	0 : 7 : 0	8	140	269.62
1.921	21	1	9	1	270.90
1.917	22	2	10	2	272.18
1.912	23	3	11	3	273.46
1.908	6 : 0	4	12 : 0	4	274.73

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Penny w.^t	Ounces	Pounds	
1.903	6:1	0:7:5	12:1	145	276.00
1.899	2	6	2	6	277.27
1.895	3	7	3	7	278.53
1.891	4	8	4	8	279.80
1.886	5	9	5	9	281.05
1.882	6	10	6	150	282.31
1.878	7	11	7	1	283.56
1.874	8	12	8	2	284.81
1.870	9	13	9	3	286.06
1.866	10	14	10	4	287.31
1.862	11	15	11	5	288.55
1.858	12	16	13:0	6	289.79
1.854	13	17	1	7	291.03
1.850	14	18	2	8	292.26
1.846	15	19	3	9	293.49
1.842	16	0:8:0	4	160	294.72
1.838	17	1	5	1	295.95
1.834	18	2	6	2	297.17
1.831	19	3	7	3	298.39
1.827	20	4	8	4	299.61
1.823	21	5	9	5	300.83
1.820	22	6	10	6	302.05
1.816	23	7	11	7	303.26
1.812	7:0	8	14:0	8	304.47

How often its Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Pennywt.	Ounces.	Pounds.	
1.809	7 : 1	0:8:9	14:1	169	305.67
1.805	2	10	2	170	306.88
1.802	3	11	3	1	308.08
1.798	4	12	4	2	309.28
1.795	5	13	5	3	310.48
1.791	6	14	6	4	311.67
1.788	7	15	7	5	312.87
1.784	8	16	8	6	314.06
1.781	9	17	9	7	315.25
1.778	10	18	10	8	316.43
1.774	11	19	11	9	317.62
1.771	12	0:9:0	15:0	180	318.80
1.768	13	1	1	1	319.98
1.765	14	2	2	2	321.15
1.761	15	3	3	3	322.33
1.758	16	4	4	4	323.50
1.755	17	5	5	5	324.67
1.752	18	6	6	6	325.84
1.749	19	7	7	7	327.01
1.746	20	8	8	8	328.17
1.743	21	9	9	9	329.34
1.739	22	10	10	190	330.50
1.736	23	11	11	1	331.66
1.733	8 : 0	12	16:0	2	332.81

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Penny w^{ts}.	Ounces.	Pounds	
1.730	8:	0:9:13	16:1	193	333.97
1.727	2	14	2	4	335.12
1.724	3	15	3	5	336.27
1.721	4	16	4	6	337.42
1.719	5	17	5	7	338.57
1.716	6	18	6	8	339.71
1.713	7	19	7	9	340.85
1.710	8	0:10:0	8	200	342.00
1.707	9	1	9	1	343.13
1.704	10	2	10	2	344.27
1.701	11	3	11	3	345.41
1.699	12	4	17:0	4	346.54
1.696	13	5	1	5	347.67
1.693	14	6	2	6	348.80
1.690	15	7	3	7	349.93
1.687	16	8	4	8	351.05
1.685	17	9	5	9	352.18
1.682	18	10	6	210	353.30
1.680	19	11	7	1	354.42
1.677	20	12	8	2	355.54
1.674	21	13	9	3	356.66
1.672	22	14	10	4	357.77
1.669	23	15	11	5	358.89
1.666	9:0	16	18:0	6	360.00

How often its Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny wts.	Ounces.	Pounds.	
1.664	9:1	0:10:17	18:1	217	361.11
1.661	2	18	2	8	362.22
1.659	3	19	3	9	363.33
1.656	4	0:11:0	4	220	364.43
1.654	5	1	5	1	365.53
1.651	6	2	6	2	366.64
1.649	7	3	7	3	367.74
1.646	8	4	8	4	368.83
1.644	9	5	9	5	369.93
1.642	10	6	10	6	371.03
1.639	11	7	11	7	372.12
1.637	12	8	19:0	8	373.21
1.634	13	9	1	9	374.30
1.632	14	10	2	230	375.39
1.630	15	11	3	1	376.48
1.627	16	12	4	2	377.57
1.625	17	13	5	3	378.65
1.623	18	14	6	4	379.73
1.620	19	15	7	5	380.81
1.618	20	16	8	6	381.89
1.616	21	17	9	7	382.97
1.614	22	18	10	8	384.05
1.611	23	19	11	9	385.12
1.609	10:0	1:0:0	20:0	240	386.20

How often its Weight	Weight of the Stone				Weight Sustain'd.
	Grains	Penny wts	Ounces	Pounds	
1.607	10:1	1:0:1	20:1	241	387.27
1.605	2	2	2	2	388.34
1.603	3	3	3	3	389.41
1.600	4	4	4	4	390.47
1.598	5	5	5	5	391.54
1.596	6	6	6	6	392.61
1.594	7	7	7	7	393.67
1.591	8	8	8	8	394.73
1.589	9	9	9	9	395.79
1.587	10	10	10	250	396.85
1.585	11	11	11	1	397.91
1.583	12	12	21:0	2	398.96
1.581	13	13	1	3	400.02
1.579	14	14	2	4	401.07
1.577	15	15	3	5	402.12
1.575	16	16	4	6	403.17
1.573	17	17	5	7	404.22
1.571	18	18	6	8	405.27
1.569	19	19	7	9	406.32
1.567	20	1:1:0	8	260	407.36
1.565	21	1	9	1	408.41
1.563	22	2	10	2	409.45
1.561	23	3	11	3	410.49
1.559	11:0	4	22:0	4	411.53

How often its Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Penny wts.	Ounces	Pounds	
1.557	11:1	1:1:5	22:1	265	412.57
1.555	2	6	2	6	413.61
1.553	3	7	3	7	414.64
1.551	4	8	4	8	415.68
1.549	5	9	5	9	416.71
1.547	6	10	6	270	417.74
1.545	7	11	7	1	418.77
1.543	8	12	8	2	419.80
1.541	9	13	9	3	420.83
1.540	10	14	10	4	421.86
1.538	11	15	11	5	422.88
1.536	12	16	23:0	6	423.91
1.534	13	17	1	7	424.93
1.532	14	18	2	8	425.95
1.530	15	19	3	9	426.97
1.528	16	1:2:0	4	280	427.99
1.527	17	1	5	1	429.01
1.525	18	2	6	2	430.03
1.523	19	3	7	3	431.05
1.521	20	4	8	4	432.06
1.519	21	5	9	5	433.07
1.518	22	6	10	6	434.09
1.516	23	7	11	7	435.10
1.514	12:0	8	24:0	8	436.11

How often its Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Pennyw^{ts}.	Ounces	Pounds	
1.513	12:1	1:2:9	24:1	289	437.12
1.511	2	10	2	290	438.13
1.509	3	11	3	1	439.13
1.507	4	12	4	2	440.14
1.506	5	13	5	3	441.14
1.504	6	14	6	4	442.14
1.502	7	15	7	5	443.15
1.500	8	16	8	6	444.15
1.499	9	17	9	7	445.15
1.497	10	18	10	8	446.15
1.496	11	19	11	9	447.14
1.494	12	1:3:0	25:0	300	448.14
1.492	13	1	1	1	449.14
1.490	14	2	2	2	450.13
1.489	15	3	3	3	451.12
1.487	16	4	4	4	452.12
1.486	17	5	5	5	453.11
1.484	18	6	6	6	454.10
1.483	19	7	7	7	455.08
1.481	20	8	8	8	456.07
1.479	21	9	9	9	457.06
1.478	22	10	10	310	458.04
1.476	23	11	11	1	459.03
1.474	13:0	12	26:0	2	460.01

How often its Weight.	*Weight of the Stone.*				*Weight Sustain'd.*
	Grains	*Penny w^{ts}.*	*Ounces.*	*Pounds*	
1.473	13:1	1:3:13	26:1	313	460.99
1.471	2	14	2	4	461.98
1.470	3	15	3	5	462.96
1.468	4	16	4	6	463.94
1.467	5	17	5	7	464.91
1.465	6	18	6	8	465.89
1.464	7	19	7	9	466.87
1.462	8	1:4:0	8	320	467.84
1.460	9	1	9	1	468.82
1.459	10	2	10	2	469.79
1.457	11	3	11	3	470.76
1.456	12	4	27:0	4	471.73
1.454	13	5	1	5	472.70
1.453	14	6	2	6	473.67
1.451	15	7	3	7	474.64
1.450	16	8	4	8	475.61
1.448	17	9	5	9	476.57
1.447	18	10	6	330	477.54
1.445	19	11	7	1	478.50
1.444	20	12	8	2	479.47
1.442	21	13	9	3	480.43
1.441	22	14	10	4	481.39
1.439	23	15	11	5	482.35
1.438	14:0	16	28:0	6	483.31

How often its Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny wts.	Ounces.	Pounds	
1.436	14:1	1:4:17	28:1	337	484.27
1.435	2	18	2	8	485.23
1.434	3	19	3	9	486.18
1.432	4	1:5:0	4	340	487.14
1.431	5	1	5	1	488.09
1.430	6	2	6	2	489.05
1.428	7	3	7	3	490.00
1.427	8	4	8	4	490.95
1.425	9	5	9	5	491.90
1.424	10	6	10	6	492.85
1.423	11	7	11	7	493.80
1.421	12	8	29:0	8	494.75
1.420	13	9	1	9	495.70
1.419	14	10	2	350	496.64
1.417	15	11	3	1	497.59
1.416	16	12	4	2	498.53
1.414	17	13	5	3	499.48
1.413	18	14	6	4	500.42
1.412	19	15	7	5	501.36
1.410	20	16	8	6	502.30
1.409	21	17	9	7	503.24
1.408	22	18	10	8	504.18
1.406	23	19	11	9	505.12
1.405	15:0	1:6:0	30:0	360	506.06

How often its Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny w^{ts}.	Ounces.	Pounds.	
1.404	15:1	1:6:1	30:1	361	507.00
1.403	2	2	2	2	507.93
1.402	3	3	3	3	508.87
1.400	4	4	4	4	509.80
1.399	5	5	5	5	510.73
1.398	6	6	6	6	511.67
1.397	7	7	7	7	512.60
1.395	8	8	8	8	513.53
1.394	9	9	9	9	514.46
1.393	10	10	10	370	515.39
1.392	11	11	11	1	516.32
1.390	12	12	31:0	2	517.24
1.389	13	13	1	3	518.17
1.388	14	14	2	4	519.10
1.387	15	15	3	5	520.02
1.385	16	16	4	6	520.94
1.384	17	17	5	7	521.87
1.383	18	18	6	8	522.79
1.382	19	19	7	9	523.71
1.381	20	1:7:0	8	380	524.63
1.379	21	1	9	1	525.55
1.378	22	2	10	2	526.47
1.377	23	3	11	3	527.39
1.375	16:0	4	32:0	4	528.31

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains	Pennywts.	Ounces	Pounds	
1.374	16:1	1:7:5	32:1	385	529.23
1.373	2	6	2	6	530.14
1.372	3	7	3	7	531.06
1.371	4	8	4	8	531.97
1.370	5	9	5	9	532.88
1.369	6	10	6	390	533.80
1.368	7	11	7	1	534.71
1.366	8	12	8	2	535.62
1.365	9	13	9	3	536.53
1.364	10	14	10	4	537.44
1.363	11	15	11	5	538.35
1.362	12	16	33:0	6	539.26
1.360	13	17	1	7	540.17
1.359	14	18	2	8	541.07
1.358	15	19	3	9	541.98
1.357	16	1:8:0	4	400	542.88
1.356	17	1	5	1	543.79
1.355	18	2	6	2	544.69
1.354	19	3	7	3	545.59
1.353	20	4	8	4	546.50
1.352	21	5	9	5	547.40
1.350	22	6	10	6	548.30
1.349	23	7	11	7	549.20
1.348	17:0	8	34:0	8	550.10

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny w^{ts}.	Ounces.	Pounds	
1.347	17:1	1:8:9	34:1	409	551.00
1.346	2	10	2	410	551.89
1.345	3	11	3	1	552.79
1.344	4	12	4	2	553.69
1.343	5	13	5	3	554.58
1.342	6	14	6	4	555.48
1.341	7	15	7	5	556.37
1.339	8	16	8	6	557.27
1.338	9	17	9	7	558.16
1.337	10	18	10	8	559.05
1.336	11	19	11	9	559.94
1.335	12	1:9:0	35:0	420	560.83
1.334	13	1	1	1	561.72
1.333	14	2	2	2	562.61
1.332	15	3	3	3	563.50
1.331	16	4	4	4	564.39
1.330	17	5	5	5	565.27
1.329	18	6	6	6	566.16
1.328	19	7	7	7	567.05
1.327	20	8	8	8	567.93
1.326	21	9	9	9	568.82
1.325	22	10	10	430	569.70
1.324	23	11	11	1	570.58
1.323	18:0	12	36:0	2	571.46

How often it's Weight.	Weight of the Stone.				Weight Sustain'd.
	Grains.	Pennywts.	Ounces.	Pounds.	
1.322	18:1	1:9:13	36:1	433	572.35
1.321	2	14	2	4	573.23
1.320	3	15	3	5	574.11
1.319	4	16	4	6	574.99
1.318	5	17	5	7	575.87
1.317	6	18	6	8	576.74
1.316	7	19	7	9	577.62
1.315	8	1:10:0	8	440	578.50
1.314	9	1	9	1	579.37
1.313	10	2	10	2	580.25
1.312	11	3	11	3	581.12
1.311	12	4	37:0	4	582.00
1.310	13	5	1	5	582.87
1.309	14	6	2	6	583.74
1.308	15	7	3	7	584.62
1.307	16	8	4	8	585.49
1.306	17	9	5	9	586.36
1.305	18	10	6	450	587.23
1.304	19	11	7	1	588.10
1.303	20	12	8	2	588.97
1.302	21	13	9	3	589.84
1.301	22	14	10	4	590.70
1.300	23	15	11	5	591.57
1.299	19:0	16	38:0	6	592.44

How often it's Weight	Weight of the Stone.				Weight Sustain'd.
	Grains.	Penny wᵗ	Ounces.	Pounds	
1.298	19:1	1:10:17	38:1	457	593.30
1.297	2	18	2	8	594.17
1.296	3	19	3	9	595.03
1.295	4	1:11:0	4	460	595.90
1.294	5	1	5	1	596.76
1.293	6	2	6	2	597.62
1.292	7	3	7	3	598.49
1.291	8	4	8	4	599.35
1.291	9	5	9	5	600.21
1.290	10	6	10	6	601.07
1.289	11	7	11	7	601.93
1.288	12	8	39:0	8	602.79
1.287	13	9	1	9	603.65
1.286	14	10	2	470	604.50
1.285	15	11	3	1	605.36
1.284	16	12	4	2	606.22
1.283	17	13	5	3	607.07
1.282	18	14	6	4	607.93
1.282	19	15	7	5	608.78
1.281	20	16	8	6	609.64
1.280	21	17	9	7	610.49
1.279	22	18	10	8	611.34
1.278	23	19	11	9	612.20
1.277	1 Ounce.	2:0:0	40:0	480	613.05

Tables of Decimals &c.

Of Penny wts.

Deci-mals	1st fig.	2d fig.
	gr.	gr.
1	2	0
2	4	0
3	7	0
4	9	0
5	12	1
6	14	1
7	16	1
8	19	1
9	21	2

Of Ounces.

Deci-mals	1st fig.	2d figure.		3. fig.
	dwts	dwts	gr.	gr.
1	2	0	4	0
2	4	0	9	0
3	6	0	14	1
4	8	0	19	1
5	10	1	0	2
6	12	1	4	2
7	14	1	9	3
8	16	1	14	3
9	18	1	19	4

Of Pounds.

Deci-mals	1. st fig.		2. d figure.			3d fig.		4th fig.
	oz.	dw.	oz.	dw.	gr.	dw.	gr.	gr.
1	1	4	0	2	9	0	5	0
2	2	8	0	4	19	0	11	1
3	3	12	0	7	4	0	17	1
4	4	16	0	9	14	0	23	2
5	6	0	0	12	0	1	4	2
6	7	4	0	14	9	1	10	3
7	8	8	0	16	19	1	16	4
8	9	12	0	19	4	1	22	4
9	10	16	1	1	14	2	3	5

Tables of Grains, Penny weights, & Ounces. Shewing how many of Each Sort, are contain'd in any of the other Sorts, & in Pounds.

Penny w^{ts}.

dw^{ts}	Grains.
1	24
2	48
3	72
4	96
5	120
6	44
7	68
8	92
9	216
10	40
11	64
12	88
13	312
14	36
15	60
16	84
17	408
18	32
19	56

Ounces.

oz.	Grains.	dw^{ts}
1	480	20
2	960	40
3	1440	60
4	920	80
5	2400	100
6	880	20
7	3360	40
8	840	60
9	4320	80
10	800	200
11	5280	20

Troy Weight.

24. Grains make one Penny w^{t}.

20. Penny w^{ts}. make one Ounce.

12. Ounces make one Pound.

£.	Grains.	dn^{ts}.	oz.	£.	dn^{ts}.	oz.
1	5760	240	12	26	6240	312
2	11520	480	24	27	480	24
3	7280	720	36	28	720	36
4	23040	960	48	29	960	48
5	8800	1200	60	30	7200	60
6	34560	440	72	31	440	72
7	40320	680	84	32	680	84
8	6080	920	96	33	920	96
9	51840	2160	108	34	8160	408
10	7600	400	20	35	400	20
11	63360	640	32	36	640	32
12	9120	880	44	37	880	44
13	74880	3120	56	38	9120	56
14	80640	360	68	39	360	68
15	6400	600	80	40	600	80
16	92160	840	92	41	840	92
17	7920	4080	204	42	10080	504
18	103680	320	16	43	320	16
19	9440	560	28	44	560	28
20	115200	800	40	45	800	40
21	120960	5040	52	46	11040	52
22	6720	280	64	47	280	64
23	132480	520	76	48	520	76
24	8240	760	88	49	760	88
25	144000	6000	300	50	12000	600

Ł.	Pennyw^{t}	oz.	Ł.	Pennyw	oz.
51	12240	612	76	18240	912
52	480	24	77	480	24
53	720	36	78	720	36
54	960	48	79	960	48
55	13200	60	80	19200	60
56	440	72	81	440	72
57	680	84	82	680	84
58	920	96	83	920	96
59	14160	708	84	20160	1008
60	400	20	85	400	20
61	640	32	86	640	32
62	880	44	87	880	44
63	15120	56	88	21120	56
64	360	68	89	360	68
65	600	80	90	600	80
66	840	92	91	840	92
67	16080	804	92	22080	1104
68	320	16	93	320	16
69	560	28	94	560	28
70	800	40	95	800	40
71	17040	52	96	23040	52
72	280	64	97	280	64
73	520	76	98	520	76
74	760	88	99	760	88
75	18000	900	100	24000	1200

From Grains to Penny Weights.

1	0.3466807
2	0.6933614
3	1.0400421
4	1.3867228
5	1.7334035
6	2.0800842
7	2.4267649
8	2.7734456
9	3.1201263

From Grains to Ounces.

1	0.1277183
2	0.2554366
3	0.3831549
4	0.5108732
5	0.6385915
6	0.7663098
7	0.8940281
8	1.0217464
9	1.1494647

From Grains to Pounds.

1	.05578610
2	.11157220
3	.16735830
4	.22314440
5	.27893050
6	.33471660
7	.39050270
8	.44628880
9	.50207490

The Value in Money of any Loadstone. from Grains.

1	.00500000
2	.01000000
3	.01500000
4	.02000000
5	.02500000
6	.03000000
7	.03500000
8	.04000000
9	.04500000

From Penny w^{ts} to Grains.	
1	02.884500
2	05.769000
3	08.653500
4	11.538000
5	14.422500
6	17.307000
7	20.191500
8	23.076000
9	25.960500

From Penny w^{ts} to Ounces.	
1	0.3684032
2	0.7368064
3	1.1052096
4	1.4736128
5	1.8420160
6	2.2104192
7	2.5788224
8	2.9472256
9	3.3156288

From Penny w^{ts} to Pounds.	
1	0.1609150
2	0.3218300
3	0.4827450
4	0.6436600
5	0.8045750
6	0.9654900
7	1.1264050
8	1.2873200
9	1.4482350

The Value in Money of any Loadstone. from Penny w^{ts}.	
1	.01442250
2	.02884500
3	.04326750
4	.05769000
5	.07211250
6	.08653500
7	.10095750
8	.11538000
9	.12980250

	From Ounces to Grains.
1	07.829734
2	15.659468
3	23.489202
4	31.318936
5	39.148670
6	46.978404
7	54.808138
8	62.637872
9	70.467606

	From Ounces to Penny Weights.
1	02.714419
2	05.428838
3	08.143257
4	10.857676
5	13.572095
6	16.286514
7	19.000933
8	21.715352
9	24.429771

	From Ounces to Pounds.
1	0.4367903
2	0.8735806
3	1.3103709
4	1.7471612
5	2.1839515
6	2.6207418
7	3.0575321
8	3.4943224
9	3.9311127

	The Value in Money of any Loadstone from Ounces.
1	.03914867
2	.07829734
3	.11744601
4	.15659468
5	.19574335
6	.23489202
7	.27404069
8	.31318936
9	.35233803

	From Pounds to Grains.
1	017.92562
2	035.85124
3	053.77686
4	071.70248
5	089.62810
6	107.55372
7	125.47934
8	143.40496
9	161.33058

	From Pounds to Penny Weights
1	06.214465
2	12.428930
3	18.643395
4	24.857860
5	31.072325
6	37.286790
7	43.501255
8	49.715720
9	55.930185

	From Pounds to Ounces.
1	02.289429
2	04.578858
3	06.868287
4	09.157716
5	11.447145
6	13.736574
7	16.026003
8	18.315432
9	20.604861

	The Value in Money of any Loadstone from Pounds.
1	.08962810
2	.17925620
3	.26888430
4	.35851240
5	.44814050
6	.53776860
7	.62739670
8	.71702480
9	.80665290

MVSEVM
BRITAN
NICVM